

REMARKS

After entry of this amendment, claims 1 and 3-18 are pending in the application. Claim 1 has been amended to remove a double recitation and not to overcome a cited reference. Claim 3 has been indicated as being allowable over the prior art of record, if rewritten into independent form including all of the limitations of the base claim and any intervening claims. Reconsideration of the application as amended is requested.

In the office action dated May 8, 2007, the Examiner rejected claims 1, 4-5, 7-11 and 13-18 under 35 U.S.C. §103(a) as being unpatentable over Wallace et al. (U.S. Pat. No. 5,769,581) in view of Hesthamar et al. (U.S. Pat. No. 5,343,759). The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al and according to the teachings of Hesthamar et al for the purpose of providing a sensor system which is fast, easy to handle, reliable, highly sensitive to strains and stresses in an object and that is insensitive to stray fields and temperature. It is submitted that Hesthamar et al. fails to disclose a force sensory layer which changes its electrical resistance due to changes of an applied force, and it is unclear how the mechanical washer disclosed in Wallace et al. could be combined with the magnetoelastic ribbons of Hesthamar et al. to meet the limitations recited in the current claims due to the incompatibility of measuring principles. The magnetoelastic ribbons of Hesthamar et al. represent a force sensory layer, yet Hesthamar et al. discloses a device based on the phenomenon of magnetoelasticity, not piezoresistivity. Magnetoelasticity is a change of the magnetic permeability due to a change in length of the force sensory layer in the direction of the axial strain. Piezoresistivity is a change in electrical resistance due to an applied force. It is not disclosed in Hesthamar et al. that the magnetoelastic ribbons exhibit piezoresistive phenomena, since that is irrelevant to the force measurement of Hesthamar et al, where one tries to avoid the previous disadvantages by explicitly avoiding piezoresistive force layers. This is clear from the description of the technical background in Hesthamar et al., where the use of piezoresistive gauges is described as being too expensive. Hesthamar et al. thus tries to use a

different measurement principle, i.e. magnetoelastic. As for the measurement principle of Hesthamar et al., as stated in column 4, line 45 of Hesthamar et al., the magnetoelastic ribbons 7 have the function of a core of the pick-up-coil 10. Furthermore, it is stated that the magnetic properties of a core are dependent on the preload of a screw or similar. By applying force onto the sensor means 2, the permeability of the magnetoelastic ribbons 7 changes due to the axial strain (column 4, lines 51-53). The change in the permeability causes a change in the magnetic field produced by the excitation and pick-up-coil 10. This change of the magnetic field, flowing through the coil and the sensor means causes a change in the magnetic impedance, which is measured as a drop in the electric potential of the circuit attached either to the pick-up-coil or the sensor means. Yet it is not disclosed that the magnetoelastic ribbons 7 change their electrical resistance. Therefore, the Hesthamar et al. reference does not disclose a force sensory layer with the same features as the force sensory layer described in pending claims 1, 4-5, 7-11, and 13-18 of the present application; and it is believed that claims 1, 4-5, 7-11 and 13-18 are patentable over the prior art of reference. Reconsideration of the Examiner's rejection is requested.

Claims 6 and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wallace et al in view of Hesthamar et al, and further in view of Walton (U.S. Pat. No. 5,291,789). The Examiner states that Wallace et al and Hesthamar et al disclose all of the limitations of these claims except for an electrically insulating layer and the prominence areas being electrically separated. The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al and Hesthamar et al according to the teaching of Walton for the purpose of, advantageously providing a method to indicate the load to which a member is subjected that includes an indicating means which gives an electrical signal when the stress to the main body of the fastener exceeds a predetermined value (See Walton, col. 2, lines 24-32). It is submitted that the addition of the Walton reference does not overcome the deficiencies of the combination of Wallace et al and Hesthamar et al for the same reasons as stated above, as if restated here in their entirety. Furthermore, the Walton

reference discloses an electrical contact 24 which is held in a position adjacent to an axially facing surface 20 of the bolt and in a fixed position relative to a remote part of the bolt. Tightening the bolt of Walton reduces clearance between the contact and the surface of the bolt until the clearance is eliminated in order to illuminate the bulb. In other words, the Walton reference teaches an on/off bulb switch indicating when the clearance has been eliminated between the contact and the surface of the bolt. It is submitted that the combination of Wallace et al, Hesthamar et al, and/or Walton, taken in any permissible combination, does not anticipate, teach, or suggest that the force sensory layer changes electrical resistance due to changes of an applied force, and that the surface of the layer has as support profiles flat prominences constructed for recording a force applied by the force application elements. Reconsideration of the Examiner's rejection is requested.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be

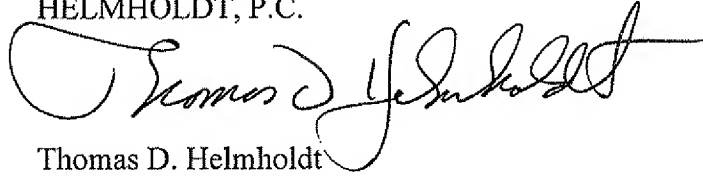
Date: August 8, 2007

Response to Office Action dated May 8, 2007

expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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HELMHOLDT, P.C.

A handwritten signature in black ink, appearing to read "Thomas D. Helmholdt", written over a horizontal line.

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TDH/th